THE LINDE GROUP

Operating Manual.

HiQ® Zero Air Station.

Applicable to the following HiQ® Zero Air Stations:
Zero Air Station 1.5, Zero Air Station 3, Zero Air Station 6,
Zero Air Station 10, Zero Air Station 20 and Zero Air Station 30.
Date January 2011

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Chapter 1. Introduction.

This manual provides the necessary information for the installation and operation for the HiQ® Zero Air Station series. It also includes information for simple maintenance operations as well as troubleshooting tips. This manual is applicable for the following Zero Air station models:

- HiQ® Zero Air Station 1.5
- HiQ® Zero Air Station 3
- HiQ® Zero Air Station 6
- HiQ® Zero Air Station 10
- HiQ® Zero Air Station 20
- HiQ® Zero Air Station 30

This operating manual consider and describe an instrument generally equipped with the most complex configuration; should the explanation concerning the most complex instrument be to different from the simpler instrument, both cases will be described separately.

Chapter 2. General Information and Compatibility To Normalisations.

2.1 Notes on the FCC compatibility

This equipment has been tested and found compatible within the Class B limits of the digital instruments, chapter 15 of the FCC regulation. These limits have been defined in order to provide a reasonable protection against the strong electrical interferences in the installations inside a residential area. This instrument generate, use and can send out some radio frequency if it's installed without following the manufacturer instructions; moreover it can generate in the case of certain installations some interferences to the electrical radio communication.

Should this instrument produce some significant interference to the radio and television, this case can be identified by plugging and unplugging the instrument. We recommend, in order to eliminate the interferences, to take one or more of the following actions:

- Re-orientate or redirect the antenna
- Increase the distance between the equipment and the receiver
- Plug the equipment in a different electric circuit from the one alimenting the receiver
- If none of the above mentioned actions are giving results, contact an experienced technician or selling agent in radio/TV.

2.2 CE Conformity

This equipment was built in compliance and is compatible with EC recommendations concerning electrical safety and electromagnetic emissions. It complies with 89/336/EWG, 93/98/EWG, standards EN 50 081-1, in 50 081-2, EN 50 082 - 1 and EN 50 082 - 2.

Note
Any modifications on the instrument which have not been approved in writing by the manufacturer will automatically cancel the manufacturer warranty. If such modifications are nevertheless undertaken, they are under the user responsibility; the manufacturer will under no circumstances be responsible for any damages direct or indirect which they would cause

2.3 W.E.E.E. product Recycling declaration

In agreement with the European EC/2002/96 directive on electrical and electronic equipment recycling, this product may not be disposed of in the garbage. For recycling information, contact the company who sold this product. If you want to get rid of this instrument, identify it as such and direct it to a certified recycling centre.

2.4 Security Instructions and correct use

This Zero Air station has been designed in order to produce zero air for laboratory applications. This generator must only be used for such applications respecting the specifications and recommendations for its proper use described in this operating manual. The main recommendations are:

- This generator should only be operated and used indoors.
- This generator can only be used at temperatures above 4°C
- This generator should only be used in a well ventilated room.
- In case of inside maintenance requirements, always unplug it before opening the casing(s).
- Only the spare parts described in chapter 5 can be changed by the user. Other maintenances action on this instrument must be undertaken by trained and authorized technician.

Chapter 3. Specifications and Description.

3.1 Specifications

Zero Air outlet flow (values at 20°C and 1013 mbar of atmospheric pressure)	HiQ Zero Air Station - 1.5 : Flow rate 1.5 NL/min maximum HiQ Zero Air Station - 3 : Flow rate 3 NL/min maximum HiQ Zero Air Station - 6 : Flow rate 6 NL/min maximum HiQ Zero Air Station - 10 : Flow rate 10 NL/min maximum HiQ Zero Air Station - 20 : Flow rate 20 NL/min maximum HiQ Zero Air Station - 30 : Flow rate 30 NL/min maximum
Delivery pressure	Up to 6 barg (90 Psig)
Zero Air purity	<0.1 ppm Total Hydrocarbons
Operating principle for removal of hydrocarbons	catalyst chamber filled with Pt+Pd catalyst heated to very high temperature
Drying system	Static Dryer without maintenance
Display	Monochrome LCD graphic display, of 128 x 64 pixels
Keyboard	Contextual, touch sensitive
Manual interface control	Adjust operating points, system status Functioning diagnosis, users settings, keyboard and screen adjustment.
Remote control	Through USB interface: alarms standard reading Remote control software on option Through dry rely ; 1 entry (Start/Stop) and 1 alarm
Alimentation voltage	100 V/60Hz; 110-117V/50-60Hz; 220- 240V / 50-60 Hz

Maximum electric consumption	HiQ Zero Air Station - 1.5 : 300W maximum HiQ Zero Air Station - 3 : 300W maximum HiQ Zero Air Station - 6 : 300W maximum HiQ Zero Air Station - 10 : 550W maximum HiQ Zero Air Station - 20 : 550W maximum HiQ Zero Air Station - 30 : 550W maximum
Pressure display accuracy	0.1 bar (± 0.5 %)
Outlet fitting	Stainless steel double ring : 1/8" for ZAS 1.5 to 10 1/4" for ZAS 20 and ZAS 30
Functioning conditions:	
→ Temperature	+10°C to +35°C
→ Relative Humidity	0-80%, non condensing
Transport and storage conditions:	
→ Temperature	+0°C to +35°C
→ Relative Humidity	0-90%, non condensing
Category of surge	II
Grade of pollution	2
Sound pressure	<55 dB(A)
Net weight	ZAS-1.5L : 40 Kg ZAS-3L : 45 Kg ZAS-6L : 45 Kg ZAS-10L : 55 Kg ZAS-20L : 55 Kg ZAS-30L : 60 Kg
Casing size : all models	360 x 640 x 695 mm (LxPxH)
Packaging size	450 x 800 x 800 mm (LxPxH)

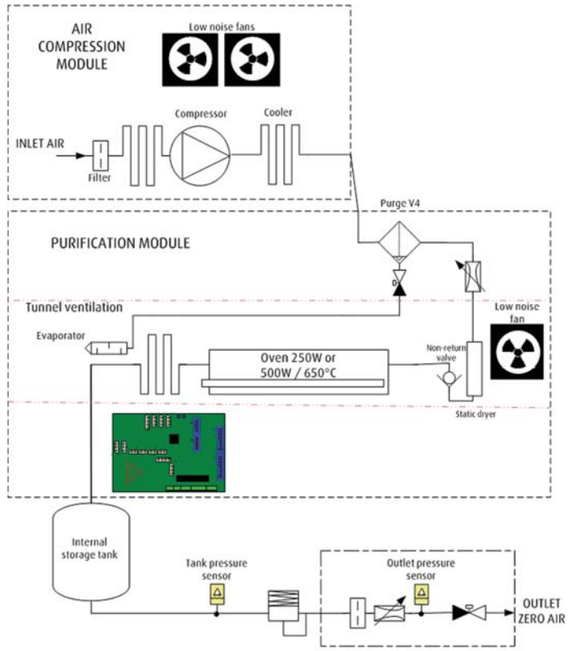
3.2 Instrument presentation

HiQ Zero Air Stations are supplied as single case unit. The unit should be placed on the floor under the working bench. The front face is divided into two parts, the upper part contains an information screen with touch keyboard and the lower part fitted with hinges allow to access to the pressure setting and inlet filter.

The lower part of the back plate is the air compression module and the upper module is the compressed air purification module. The main plug connection, fuse and power switch as well as the Zero Air outlet is located on the upper module.

3.3 Functioning principle: basic equipment

The HiQ® Zero Air station models utilise a multi-stage process to purify ambient air into analytical grade air. Compressed ambient air is initially passed through highly efficient pre-filtration to remove both moisture and particles greater than 5 microns. After filtration, the air is channelled into a stainless steel catalyst chamber to remove background hydrocarbons and carbon monoxide. The chamber is filled with a highly efficient platinum + palladium catalyst which has been heated to very high temperature to ensure final hydrocarbon removal to less than 0.1 ppm. The zero air is stored in an internal storage tank allowing the compressor to stop when reached the upper pressure level and starting again when at the lower level. An additional final high-grade filter is used to remove 99.99% of particles greater than 0.5 microns. At this point the Air is available at the outlet fitting. The compressor is driven by the tank pressure ; it will stop itself when the upper set pressure value is reached and start again when the lower set pressure is reached which will be above the set outlet pressure.



Zero Air Station

1 Frame, 2 Electronic control module, 3 Tank, 4 Air purifier module, 5 Air compression module

3.4 Functioning principle: options

3.4.1 Remote control by dry rely

The option remote control by dry rely can perform a simple remote control between the zero air station and a external compatible « controller ». This remote control enable the start up and shut down of the Station through a supply voltage between 2 terminal of the connector. The station responds by closing or opening a relay in the event of an alarm. The remote control can be NC (normally closed) or NO (normally open).

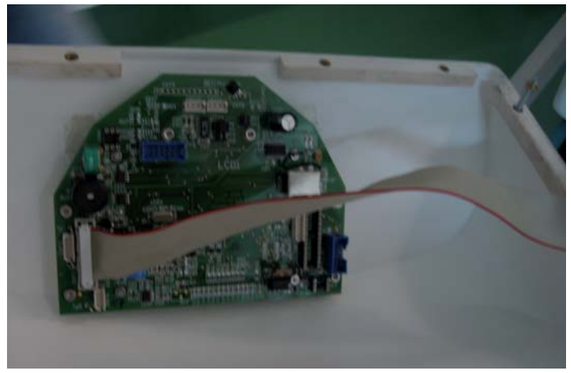
3.4.2 Remote control via USB interface

USB remote control option allows you to read and monitor the operation of the instrument from a PC. The delivery of the option is a software owner running under Windows (Windows 2000, XP, VISTA and Windows 7), a USB cable and operating manual.
The details of this option are described under 4.10.

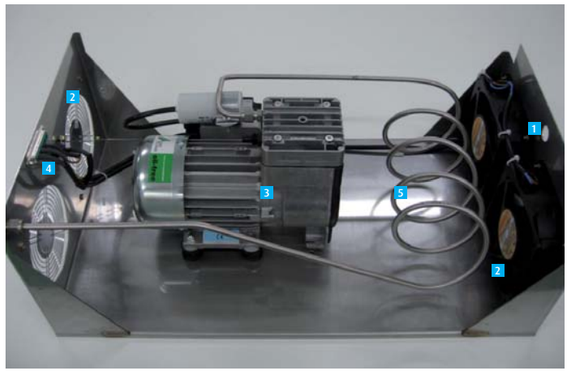
3.5 Internal Structures

The Zero Air station, is built on a modular concept, it is mainly composed of control module and a service module:

- a light grey steel case , composed of a frame with sheet –metal protection panels.
- an electronic control module
- an air compression module
- a purification module
- tanks and linking tubes with the filtration module



MB3800 card fixed inside the lead (view from inside)



1 Inlet filter, 2 Ventilation system, 3 Compressor, 4 Command connector, 5 Cooling coil

3.5.1 Electronic module

The electronic control module is composed of a plastic fire proof cover, upper part of front face and one board, MB3800. The main board MB3800 has the following functions:

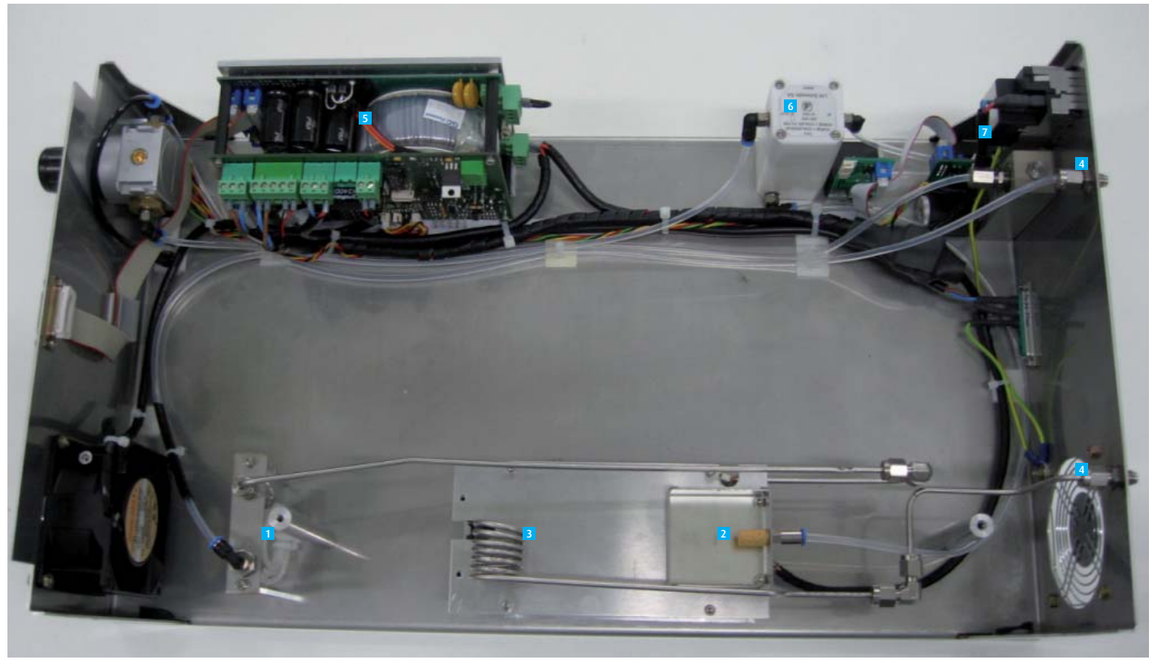
- Support and management of the LCD screen with its integrated touch keyboard
- External communications
- Communications to other modules
- Main processor

Note: the MB3800 is powered from the purification module.

3.5.2 Air Compression module

This module has:

- One Inlet filter(s), can be reached from the back of the lower front face
- The compressor, the type vary depending on the zero air station capacity,
- A stainless steel cooling coil
- the ventilation system



1 Static dryer, 2 Evaporator, 3 Catalytic oven with cooling coil, 4 Connection fittings with tank(s), 5 Gous3-ZAS with power supply PS3550-30, 6 Coalescing filter (purge V4), 7 Air Outlet module

3.5.3 Air purification module

This module has:

- The coalescing filter with automatic purge
- The static dryer
- The catalytic oven with cooling coil and forced ventilation. Evaporator fixed on top
- The outflow module
- The electronic control board GOUS3L0
- The power supply board PS3550
- The pressure regulator with 2 sensors fitted on a board

Chapter 4. Installation and Operation.

4.1 Upon receiving your HiQ® Zero Air station

Each instrument is inspected and packaged prior to transport with great attention. Immediately after receipt, we recommend to perform a quick visual inspection of the package as well as the LABEL-SHOCK shock detector. If it turned red, report it in writing to the carrier at the time of delivery

The Zero Air station is put on an individual wooden mini-palette 40x80cm, which is the basis of its transport packaging. Its upper part is protected by shaped foams and a thick cardboard. The thick cardboard is screwed on the palette. The unpacking of the station from its packaging start by unscrewing the cardboard, then cutting the straps. At this stage it is possible to verify the visual integrity of the instrument.

Any damages must be immediately identified and photographed; It should be reported to the carrier as well as to your Linde representative. DO NOT ATTEMPT TO USE THE GENERATOR. For major damages, the generator shall be returned to the manufacturer after coordination with Linde customer service who will provide return goods documents and procedures.

4.2 Delivery content

Quantity	Description
1	HiQ® Zero Air Station (ZAS)
1	Quick starting guide (QSG)
1	Operating manual on CD
1	Verification and calibration certificate
1	Electric cable 230V, CE
1	Shipping box

4.3 Station installation

- The Zero Air station must be installed on a flat surface, without vibrations, avoiding potential shocks and excessive heat source. The generator should not be in contact with other devices on any of its walls, a sufficient distance is necessary to avoid to communicate to other instrument the small vibrations produced.
- Operate the generator in an open and well ventilated area, in which the temperature does not go **below 0°C.** The good functioning of the generator is guaranteed for a temperature between +10 and +35°C.
- **To ensure proper ventilation, a clear space of at least 20cm is necessary at the back of the generator. The Air cooling admission is located on the lower front panel and should under no circumstances be obstructed.**

4.4 Electric connections

Mains: Connect the Zero Air station with the electrical cable provided; if using an alternative cable, verify that it has the appropriate ground wire (3X1mm2 minimum). Make sure laboratory differential circuit breaker can absorb an increased current of at least 6A without switching off.

Note: the Zero Air station is equipped with fuses to protect the compressor on one hand, the Catalysis oven and electronics control on the other hand. They are placed on the back of each tray.

4.5 Fluidic connections

The produced zero air is available from the ZERO AIR OUTLET located at the back of the instrument. This outlet is equipped with a stainless steel compression fitting. We recommend that the supply line from the station to point of use be a laboratory grade stainless steel (1/8" for the 1.5 – 6L units and 1/4" for the 10-30L units) which has been cleaned and free from grease and other particles. Use of PFA or TEFLON tubing is not recommended as hydrocarbon can diffusion through the walls and change the quality of the zero air.

Perform the connection to your application only after the purge cycle described below have been performed.

The outlet pressure is adjusted by the pressure regulator placed under the lower panel and can be visualized permanently on the screen.

CAUTION: Your Zero Air station has been tested and purged prior to shipment to remove any hydrocarbons originate from ambient air. After a downtime of several days or weeks, the generator should be purged again prior to use according to the purge cycle, described below.

4.6 Initial Start-up

CAUTION: the dialogue between the generator and its user is initially done via the touch screen placed on the front top Panel. Orders or submenus are obtained by pressing lightly with a finger on the chosen area. We strongly discourage the use of objects such as pen pointing, the sensitive side of the screen might be irretrievably degraded.

4.6.1 Start-up

Turn the generator on with the switch placed on the back of the generator. The identification image appears during approximately 30 seconds the following information will be shown, the maker, model, serial number as well as the software revision.

ZERO AIR STATION
ZAS-3 EU
Software Rev V1.1
Serial # ZAS1-091004099

Note: In order to facilitate the first start-up in your laboratory, the Zero Air station has been set in the factory for an automatic start-up and produce zero air pressure at 5 bar.

After the presentation, the main image appears

II	**STARTING**	**Menu**
Pressure Set : 5.0 bar		
Actual value : 0.2 bar		
Oven Temperature : 245°C		

and the oven starts heating.
When the oven temperature reaches approximately 550 ° C, the compressor starts and fill in the tank.

II	**RUNNING**	**Menu**
Pressure Set : 5.0 bar		
Actual value : 0.2 bar		
Oven Temperature : 648°C		

It is possible to check the filling up progression of tank by pressing on MENU then select Diagnostic and AIR Pressure.
The image present the tank pressure, the outlet pressure, the maximum pressure (alarm), and the functioning state of the compressor.

4.6.2 Purge Cycle

Before connecting the generator and the alimentation tube to the consumer, it is necessary to proceed to a purge of the system, for this, two solutions are proposed:

1. Passive Purge

Leave the generator continuously working between 1 or 2 hours, limiting the outflow to 1 Nl/min. Limiting the outflow with a restrictor or needle valve mounted on the zero air output.

2. Active Purge

Proceed to the purge cycle proposed by the generator software, for this:

→ Press on the function MENU then select the function TOOLS, then press ↙

Main Menu		
		↑
Tools		
(Device must be on STANDBY State)		↓
ESC	**7/7**	↙

Tools		
		↑
Purge Cycle		
		↓
ESC	**3/3**	↙

→ Select the function PURGE, then press on. ↙

Purge Cycle	
Under Process	
Remaining Time : 118min	
ESC	**STOP**

At this point the Zero Air station starts a tank filling up phase followed by its emptying phase up to 1 bar. The full purge cycle time depend on the compressor capacity, and of the volume to be purged and the maximum consummation, therefore of the model of the station

The purge cycle can at any time be stop by pressing on STOP
When the cycle is finished, it goes back into the normal functioning windows.

From this moment, it is recommended to connect the outlet tube to the consumer and proceed to the pressure setting.

4.6.3 Outlet pressure setting

The outlet pressure is regulates by a manual regulator, its setting is made manually while reading on the screen the pressure value:

- → Open the front lower panel,
- → Pull the security button to set it free from its security setting
- → Adjust the indicated pressure value requested for the installation: turn clockwise to increase the value.
- → Push back the button into its security setting.

Note: The setting procedure of the outlet pressure automatically execute a rough setting (+/- 0.5bar) of the alarms pressure setting. A different or finer setting can be done through the function AIR PRESSURE ADJUSTMENT.

At this stage, the generator is working with its factory settings. In order to improve your skills on performance, software, maintenance period, alarms and trouble shooting, we recommend that you read the further chapters and paragraphs of this document.

4.7 Control software description

4.7.1 Features overview

Once the initial boot is made, the next screen appears:

I>	**Standby**	**Menu**
Pressure Set : 5.0 bar		
Actual value : 0.2 bar		

This is the main menu allowing to set the instrument in mode: Generation (running) or stand-by.

Before generating some zero air, it is useful to adjust some settings of the generator. By pressing « **MENU** » it is possible to access to the following menus :

Main Menu		
		↑
	Air Pressure Setting	
		↓
ESC	**1/6**	↵

The First menu « **AIR pressure setting** » (setting of the AIR output pressure) allows as its name indicate to adjust the Air output pressure.

In General, for navigation, the following symbols are used:

↑ and ↓ To navigate from one menu to another or from one page to another

↵ To enter the relevant menu

ESC To exit the current MENU and return to the previous menu

1/6 the current page number and the number of pages of the relevant menu

By pressing the arrow ↓ we reach the menu « **Diagnostics** », which allows to observe all important functioning settings of the station.

Main Menu		
		↑
	Diagnostics	
		↓
ESC	**2/6**	↵

Other menus are:

Tools:
Providing access to various tests including the compressor test.

Main Menu		
	Tools	
ESC	**3/6**	

Auxiliary functions:
Allows managing the screen and clock as well as setting the working units.

Main Menu		
		↑
	Auxiliary Functions	
		↓
ESC	**4/6**	↵

Special functions:
Which allow to set the restart mode in case of power cut as well as the remote control and the mode alarms.

Main Menu		
		↑
	Special Functions	
		↓
ESC	**5/6**	↵

Alarms and events:
Allows to view the past events.

Main Menu		
		↑
	Alarm + Events	
		↓
ESC	6/6	↵

Start up of the Zero Air generation:

I>	Standby	Menu
Pressure Set : 5.0 bar		
Actual value : 0.2 bar		
Oven Temperature : 20°C		

Once the pressure has been selected (see next chapter), just press on « **I>** » to start the Zero Air generation.

Then the following window appears:

II	Running	Menu
Pressure Set : 5.0 bar		
Actual value : 0.2 bar		
Oven Temperature : 50°C		

To stop the generation press « **II** » the instrument goes automatically on « Stand by ».

In case of alarm, the message « ALARM » appears alternating with the message "Running" or "standby".

II	Running	Menu
Pressure Set : 5.0 bar		
Actual value : 0.5 bar		
Oven Temperature : 80°C		

II	Alarm	Menu
Pressure Set : 5.0 bar		
Actual value : 0.8 bar		
Oven Temperature : 120°C		

By pressing on « Alarm » the window with the list of alarms appears:

Alarm
Alarm 1
Alarm 2
...
...
...
ESC

In general the main page indicate:

- The state of the generator: Stand-by, Running, alarm
- The set pressure
- The actual pressure
- The HC catalysis oven temperature

I>	Standby	Menu
Pressure Set : 5.0 bar		
Actual value : 1.5 bar		
Oven Temperature : 390°C		

In addition, the main page allows you to:

- To start or stop the zero air generation
- To have access to the sub menu
- To see the alarms.

Shortcut:
The center of the screen below is an active area to directly reach the pressure adjustment window.

Pressure Set : 4.0 bar
Actual value : 0.2 bar

4.7.2 Menu « Air pressure setting »
The tree menu « Air pressure setting » is as follow:

Main Menu		
		↑
	Air Pressure Setting	
		↓
ESC	1/6	↵

Air Pressure Setting		
	4.8 bar	
	IIIIIIIIIIIIIIIII	
	Touch ↵ to memorize	
ESC	1/1	↵

Air Pressure Setting
Maximum value : 6 bar
Actual value : 3.5 bar
New Value : 4.8 bar

ESC ↵

Air Pressure Setting

Value recorded

In order to set the outlet pressure, proceed as follow:

4.7.3 Menu « Diagnostics »
The simplified tree menu « Diagnostic » is as follow:

Main Menu

Diagnostics

ESC 2/6

Diagnostics

Air Pressure

ESC 1/5

Diagnostics

↑
Oven Temperature
↓

ESC 2/5 ↵

Diagnostics

↑
Functioning Time
↓

ESC 3/5 ↵

Diagnostics

↑
Case Temperature
↓

ESC 4/5 ↵

Diagnostics

Device Features

ESC 5/5

This menu allows only to observe the various functioning parameters of the instrument.

Moving within the tree is done by using the arrows « ↑ » and « ↓ ».
Once the requested setting is found, press on « ↵ » to enter into the sub-menu and « ESC » to come out.

4.7.3.1 Sub-menu « Air pressure »
This pressure is the outlet generator pressure, which will be applied onto the unit.

Diagnostics

Air Pressure

ESC 1/5

Air Pressure
Act Value : 4.5 bar
Tank Value : 6.2 bar
Max : 6.0 bar Min : 0.5 bar
IIIIIIIIIIIIIIIIIIII 75%
ADC : 3125 mV Tank : 3824mV
ESC

« Set Value » represent the requested pressure value.
« Act Value » represent the outlet pressure measured by the sensor.
« Tank Value » represent the pressure value inside the tank.
« Max » and « Min » are the maximum and minimum pressure values.
The sign « IIIIIIIIIIIIIIIIII 98% » indicate at which % max of the pressure the setting is.
« ADC » indicate the value of the pressure analogous digital converter.

4.7.3.2 Sub-menu « Oven Temperature »
This value indicates the catalysis oven temperature

Diagnostics

↑
Oven Temperature
↓

ESC 2/5 ↵

Oven Temperature

Actual Value : 645°C
Max Value : 660°C
ADC : 2825 mV

ESC

4.7.3.3 Sub-menu « Functioning Time »
This value indicate the functioning time of the generator as well as the next maintenance.

Diagnostics

Functioning Time

ESC 3/5

Functioning Time

Actual Value : 12 Hours
Next Maint. : 4000 Hours
Remaining Time : 3988 hours
IIIIIIIIIIIIIIIIIIIII 99%

ESC

« Actual Value » functioning time since beginning of the generator life
« Next Maint. » is the functioning time corresponding to the next maintenance.
« Remaining Time » remaining time before the next maintenance.
The sign « IIIIIIIIIIIIIIIIIIII 99% » indicates the functioning « reserve » before maintenance

Once the « remaining time » reaches zero, an indication « Alarm » appears on the screen main menu:

I> **Alarm** **Menu**

Pressure Set : 5.0 bar
Actual value : 4.9 bar

Oven Temperature : 645°C

When the maintenance is done, go back to the menu « Diagnostic » \ « Total functioning time » and press on « Maintenance done »

Total Functioning Time

Actual Value : 8 Hours
Next Maintenance : 4000 Hours
Remaining Time : 3992 Hours
IIIIIIIIIIIIIIIIIIII 98%
Maintenance Done
ESC

At this time « maintenance done » disappear, the messages « Next maintenance » is incremented by 4000H and the message « Remaining time » is up dated.
Moreover, the message « Alarm » on the main menu disappear.

4.7.3.4 Sub-menu « Case Temperature »
This value tells about electronic case temperature.

Diagnostics

↑
Case Temperature
↓

ESC 4/5 ↵

Case Temperature

Case Temp. : 26°C (79°F)
Alarm : 57°C (135°F)
ADC : 432
Voltage : 263 mV

ESC

« Case Temp. » represents the temperature of the electronic module
« Alarm » is the Alarm value
« ADC » represents the value of the analogue to digital voltage converter

4.7.3.5 Sub-menu « Device Features »
This sub menu allows to view the generator model, the serial number as well as the version of the software.

Diagnostics

↑
Device Features
↓

ESC 5/5 ↵

Device Features
Mod : UZAS 3L-EU
S/N : UZAS1-100304567
Software Revision : V1.2
ESC

4.7.4 Menu « Tools »

The tree of this menu is the following:

Main Menu		
	Tools	↑
ESC	3/6	↵

Tools		
	Valve Test	↑
		↓
ESC	1/4	↵

Tools		
	Oven Test	↑
		↓
ESC	2/4	↵

Tools		
	Purge Test	↑
		↓
ESC	3/4	↵

Tools		
	Pump Test	↑
		↓
ESC	4/4	↵

In order to use these tools, it is absolutely necessary to place the instrument in “Stand-By“ State mode, as below.

I>	Standby	Menu
Pressure Set : 5.0 bar		
Actual value : 0.2 bar		
Oven Temperature : 245°C		

4.7.4.1 Sub-Menu « Valve Test »

This test allows to open or close the zero air outlet valves.

Tools		
	Valve Test	
ESC	1/4	

Valve Test		
	Are you sure to enter?	
ESC		↵

By pressing on « ↵ » It is possible to go into the menu and adjust the setting value.

Valve Test		
	Touch to open valve	
ESC		

Valve Test		
	Touch to close valve	
ESC		

4.7.4.2 Sub-Menu « Oven Test »

This test allow direct access to the catalysis oven setting which can be modified as requested.

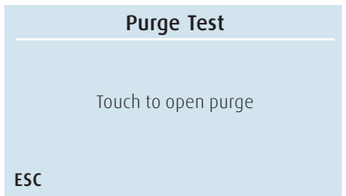
WARNING: in order to allow for a very different setting to factory default setting, this feature is little protected against excessive adjustment values. A constant temperature setting above 750°C temperature can damage the instrument.

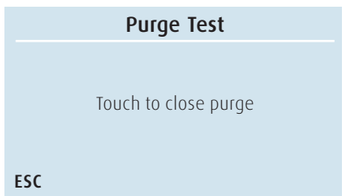
By pressing keys **++** and **–** as well as keys **+** and **–**, the temperature setting of the catalysis oven is modified. It should be noted that the measure is done inside the heating body and not on the outskirt of the oven; this explain the quick reaction of the temperature value.

4.7.4.3 Sub-Menu « Purge Test »

This test allows opening and closing the purge valve of the coalescent filter.

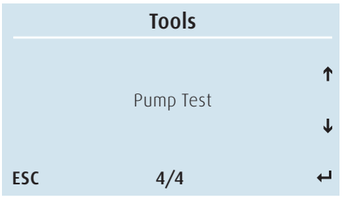
By pressing on key « ↵ » It is possible to enter into the menu and opening or closing the purge.

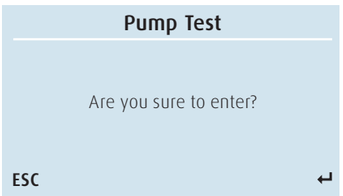




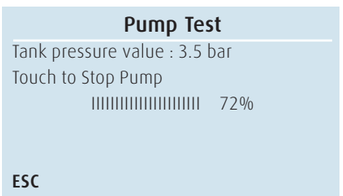
4.7.4.4 Sub-Menu « Pump Test »

This test allows to start or stop the internal compressor





By pressing on key « ↵ » It is possible to enter into the menu and control the start of the compressor as well as checking the Air pressure variation inside the tank.



4.7.5 Menu « Auxilary functions »
This menu tree is the following:

Main Menu
Auxiliary Functions
↑ ↓
ESC 5/6 ↵

Auxiliary Functions
Clock Settings
ESC 1/6

Auxiliary Functions
Display Settings
↑ ↓
ESC 2/6 ↵

Auxiliary Functions
Unit Change
↑ ↓
ESC 3/6 ↵

Auxiliary Functions
Alarm setting
↑ ↓
ESC 4/6 ↵

Auxiliary Functions
Touch Pad Calibration
ESC 5/6

Auxiliary Functions
Sounds Menu
↑ ↓
ESC 6/6 ↵

4.7.5.1 Sub-Menu « Clock setting »
This sub menu is used to set the time and date of the instrument

Auxiliary Functions
Clock Settings
↑ ↓
ESC 1/6 ↵

Clock Settings
++ +
2009
-- -
ESC Year ↵

Clock Settings
+
12
-
ESC Month

Clock Settings
++ +
17
-- -
ESC Day ↵

Clock Settings
++ +
10
-- -
ESC Hour ↵

Clock Settings

++ +

27

-- -

ESC Min ↵

Clock Settings

17/12/2009
10:27

Once entered in the menu « Clock setting », the software requires in turn the year (Year), the month (Month),the day (Day), the time (hour) and the minute (Min). Once in the menu, the « **+** » and the « **++** » allows to increase the value, the « **-** » and the « **--** » allows to decrease the value. The « **++** » and « **--** » allow a rapid scroll of the values, the « **+** » and « **-** » allows a slow scroll of values.

The entered value is validated by pressing « ↵ ». The software automatically advances to the next value.

Once all the values are entered the last "page" displays the date and time set.

4.7.5.2 Sub-Menu « Display Setting »

Auxiliary Functions

↑

Display Settings

↓

ESC 2/6 ↵

Display Settings

++ +

IIIIIIIIIIIIIIIIIIII

-- -

ESC Contrast ↵

Display Settings

++ +

IIIIIIIIIIIIIIIIIIII

-- -

ESC Backlight ↵

This sub menu allows to set the contrast (Contrast) as well as the reverse light screen (light back). Proceed adjustments with buttons « **+** », « **++** » and « **-** » and « **--** »

The value entered is validated be pressing on « ↵ ». The software automatically advances to the next value.

4.7.5.3 Sub-Menu « Unit Change »
This menu allows choosing the working units

Auxiliary Functions

↑

Unit Change

↓

ESC 3/6 ↵

Units

Pressure

ESC 1/2

Units

↑

Temperature

↓

ESC 2/2 ↵

Pressure

↑

Bar

↓

ESC 1/3 ↵

Pressure

↑

Kpa

↓

ESC 2/3 ↵

Pressure

↑

Psi

↓

ESC **3/3** ↵

Temperature

↑

°C

↓

ESC **1/2** ↵

Temperature

↑

°F

↓

ESC **2/2** ↵

Once in the « **UNIT** » menu it is possible with the keys « ↑ » and « ↓ » to change the following units: Pressure and Temperature.

Once in the requested window (Pressure or Temperature) press on « ↵ » and choose with the arrows « ↑ » and « ↓ » then validate with « ↵ » the requested unit.

For the pressure, the units are : Bar, Kilo Pascal and PSI
For the temperature the units are : Degree Celcius and Fahrenheit

4.7.5.4 Sub-Menu « Alarm Setting »

Auxiliary Functions

↑

Alarm functions

↓

ESC **4/6** ↵

Auxiliary Functions

↑

Buzzer ON

↓

ESC ↵

Value recorded

This sub menu allows enabling or disabling the sound signal in case of alarm (Buzzer).
Once in the menu, choose between “ON” or “OFF” with the arrows then valid with « ↵ ».

4.7.5.5 Sub- Menu « Touch pad Calibration »
This sub menu allows to calibrate the touch screen.

Auxiliary Functions

↑

Touch Pad Calibration

↓

ESC **5/6** ↵

Touch the pad

■ Calibration

Touch black square

X : 0 Y : 0 0

■ Calibration

Touch black square

Remove finger

Touch black square

X : 0 Y : 0 0

Calibration ■

Touch black square

Remove finger

Calibration ■

Once in the sub menu « touch pad setting » the software ask to press on the screen (Touch the pad). After having press on the screen, the software ask to press on the square place on the top left hand corner and to keep the finger on it (touch black square). At that time a counter starts up. Once arrived at the value 10, the next page ask to remove the finger (remove finger) appears. Then another calibration point is requested (bottom right hand corner). When done, the message « calibration done » (Pad Calibration done) appears.

Pad Calibration done

4.7.5.6 Sub-Menu « Sounds Menu»

Auxiliary Functions

↑

Sounds Menu

↓

ESC **6/6** ↵

Sounds Menu

↑

IIIIIIIIIIIIIIIIIIII

50% ↓

ESC ↵

This sub menu lets you adjust the duration of the sound emitted when the screen is touched. A setting to 0% totally removes the sound.

4.7.6 Menu « Special functions »
This menu tree is the following:

Main Menu

↑

Special Functions

↓

ESC **5/6** ↵

Special Functions

↑

Power Up Control

↓

ESC **1/6** ↵

Special Functions

↑

Remote Control

↓

ESC **2/6** ↵

Special Functions

Log Book download

ESC **3/6**

Special Functions

↑

Pressure Level Alarm

↓

ESC **4/6** ↵

Special Functions

↑

Service Alarm Settings

↓

ESC **5/6** ↵

Special Functions

Pass Word

ESC **6/6**

4.7.6.1 Sub-Menu « Power Up Control »

This menu is used to determine, in the event of power failure, in which state the instrument must restart. There are two possibilities:

Restart in the same Status it was before the power failure (On Last Running Status).
Restart and go in « Stand-By » Status (On Standby Status).

Special Functions

Power Up Control

↑ ↓

ESC 1/6 ↵

Power Up Control

On Standby Status

ESC 1/2

Power Up Control

On Last Running Status

↑ ↓

ESC 2/2 ↵

4.7.6.2 Sub- Menu « Remote Control »

Special Functions

Remote Control

↑ ↓

ESC 2/6 ↵

4.7.6.3 Sub- Menu « Log Book Download »

This menu allows you to download the log book on a PC in order to send it to the after sale service for a help in the diagnosis.

Special Functions

Log Book Download

↑ ↓

ESC 3/6 ↵

Log Book Download

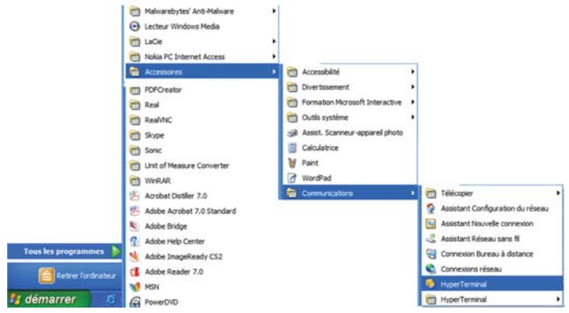
Please Connect to a PC

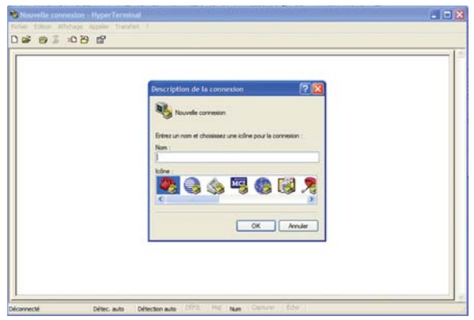
↑ ↓

ESC ↵

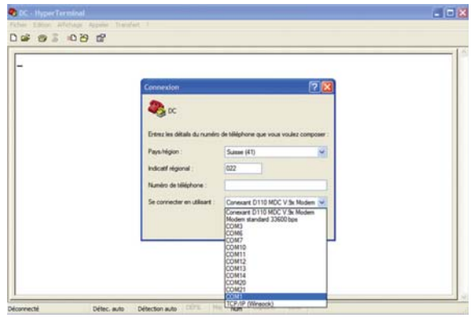
Once the page « log Book Download » is reached, it is necessary to connect the generator to a PC through a USB link. If it's the first time the generator is connected to a PC, he will request to proceed to the set up of the « driver ». It is stored on the CD provided with the instrument in the directory « driver »

Then, on the PC menu
\Start up \all programs \accessories \communication \Hyper Terminal
open the Hyper Terminal program

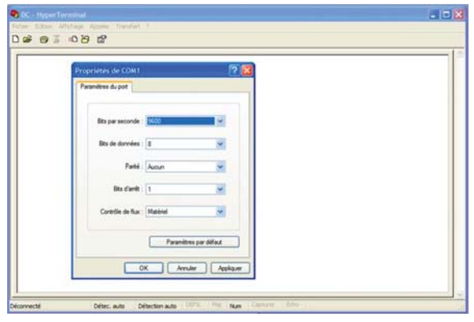




Enter a name and validate with « ENTER »



Choose « port COM » on which is plugged the USB link



Make adjustments as on the above image.
Then validate with « ENTER ». Then validate on the instrument by pressing on « ↵ ».

Log Book Download

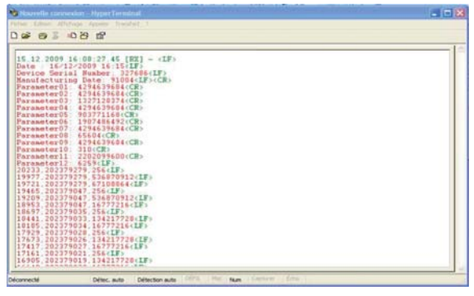
Please Connect to a PC

ESC ↵

The following window appears

OK

Log book appears (coded) in Hyper Terminal



4.7.6.4 Sub- Menu « Pressure Level Alarm»
This submenu allows to adjust the value corresponding to the minimum pressure alarm.

Special Functions

↑
Pressure Level Alarm
↓

ESC 4/6 ↵

By pressing on « ↵ », the setting window appears

Pressure Level Alarm

++ +

IIIIIIIIIIIIIIIIIIIII

-- **4.2 bar** -

ESC **Pressure Min** ↵

4.7.6.5 Sub-Menu « Service Alarm Settings »

Special Functions

↑
Service Alarm Settings
↓

ESC 5/6 ↵

PassWord

↑
0 0 0 0 0 0
↓

ESC → ↵

4.7.6.6 Sub-Menu « Pass Word »

Special Functions		
		↑
	Pass Word	
		↓
ESC	6/6	↵

PassWord		
		↑
	0 0 0 0 0 0	
		↓
ESC	→	↵

This sub menu allow access to the function « USINE » is not accessible to persons who have not received adequate training.

4.7.7 Menu « Alarm »

This menu allows to check the list of the latest alarmes:

Special Functions		
		↑
	Alarm	
		↓
ESC	6/6	↵

Alarm
15.12 10 :56 Reset
10.12 13 :34 Reset
28.11 07 :03 Pressure failed
...
...
ESC

Chapter 5. Maintenance.

1 Pressure regulator's adjustment button, 2 Inlet filter

1 Screws to fix the module (4x) by drawer

5.1 Regular HiQ® Zero Air Station maintenance

The following table summarizes the acts of maintenance as well as consumables probable replacement frequency.

Maintenance	Frequence
Air inlet filter	Every 6 months (4000H)
Coalescing filter with silencer	Every year (8000H)
Catalysis oven with heating cartridge	Every 3 years (24000H)

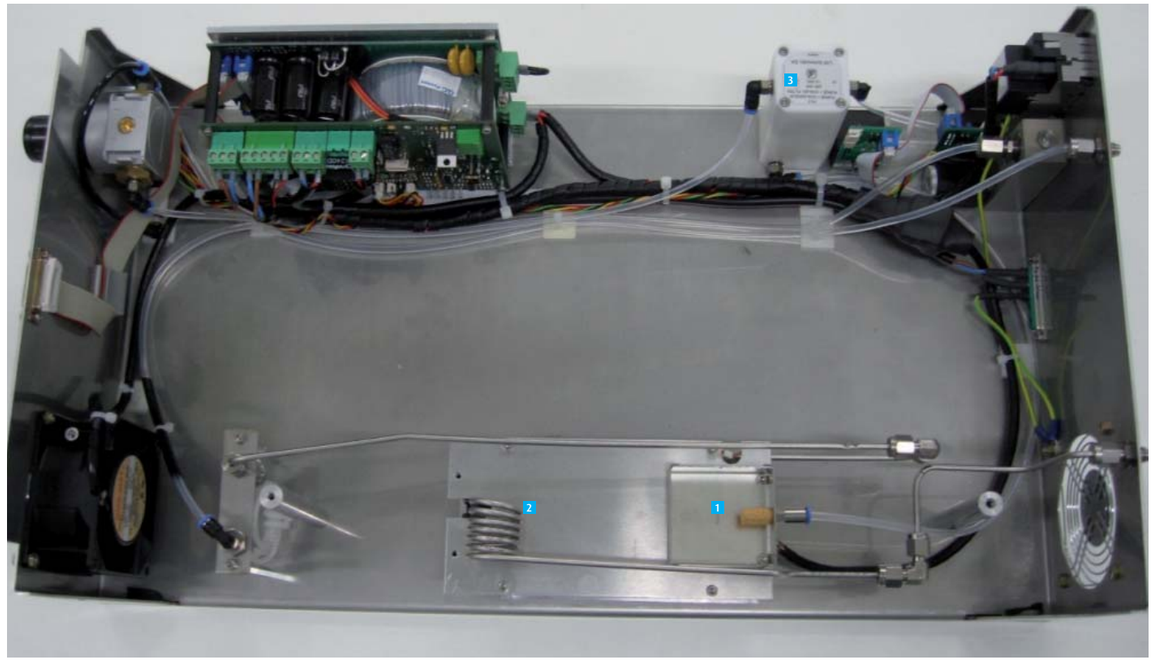
5.1.1 Air inlet filter

- → Open the lower part of front face, in order to access to the inlet filter.
- → Unscrew the filter and replace it by a new one

5.1.2 Coalescing filter with silencer

To replace the coalescing filter and silencer, we recommend to remove the Air purifier module:

- → Unscrew the lateral protection plates on both sides
- → Disconnect the cable and tubes on the rear face
- → Unscrew the 4 screws which fix the drawer
- → Remove the drawer and place it on a table
- → Remove the oven ventilation streamline body
- → Unscrew the silencer and replace by a new one
- → Open the coalescing filter and replace the filtering media,
- → Reassemble and verify tightness



1 Silencer, evaporator, 2 Catalysis oven, 3 Coalescing filter

5.1.3 Catalysis oven

- → Remove the drawer and place it on a table
- → Remove the oven ventilation streamline body
- → Disconnect the tubes
- → Disconnect the heating cartridge cable from the electronic board (Phoenix 5 pins)
- → Unscrew, from under the drawer, the 4 screws which fix the oven.
- → Exchange with the new one and replug.

5.2 List of Consumables and accessories

The following table lists the available items for light maintenance on the HiQ® Zero Air station (ZAS), as well as the recommended accessories:

Description
Inlet filter for ZAS 1.5 to ZAS 6
Inlet filter for ZAS 10 to ZAS 30
Coalescing filter with silencer for ZAS 1.5 to ZAS 30
Compressor's maintenance kit for ZAS 1.5 and ZAS 3
Compressor's maintenance kit for ZAS 6 and ZAS 10
Compressor's maintenance kit for ZAS 20 and ZAS 30
Catalysis oven with heating cartridge for ZAS 1.5, 210-240V/50-60Hz
Catalysis oven with heating cartridge for ZAS 1.5, 100-120V/60Hz
Catalysis oven with heating cartridge for ZAS 3, 210-240V/50-60Hz
Catalysis oven with heating cartridge for ZAS 3, 100-120V/60Hz
Catalysis oven with heating cartridge for ZAS 6, 210-240V/50-60Hz
Catalysis oven with heating cartridge for ZAS 6, 100-120V/60Hz
Catalysis oven with heating cartridge for ZAS 10, 210-240V/50-60Hz
Catalysis oven with heating cartridge for ZAS 10, 100-120V/60Hz
Catalysis oven with heating cartridge for ZAS 20, 210-240V/50-60Hz
Catalysis oven with heating cartridge for ZAS 20, 100-120V/60Hz
Catalysis oven with heating cartridge for ZAS 30, 210-240V/50-60Hz
Catalysis oven with heating cartridge for ZAS 30, 100-120V/60Hz

5.3 List of main spare parts and modules

The following table lists the items available for the repairs of the HiQ® Zero Air Station:

Description
Compressor equipped for ZAS1.5 and ZAS3, 210-240V/50-60Hz
Compressor equipped for ZAS1.5 and ZAS3, 100-120V/60Hz
Compressor equipped for ZAS6 and ZAS10, 210-240V/50-60Hz
Compressor equipped for ZAS6 and ZAS10, 100-120V/60Hz
Compressor equipped for ZAS20 and ZAS30, 210-240V/50-60Hz
Compressor equipped for ZAS20 and ZAS30,
Fan for the Air compression module, Wired 210-240V/50-60Hz
Fan for the Air compression module, Wired 100-120V/60Hz
Fan for the Air purifier module, Wired 210-240V/50-60Hz
Fan for the Air purifier module, Wired 100-120V/60Hz
Passive dryer, ready to use
One-way valve
Set of 2 pressure sensors, wired with calibrated electronic board
Coalescing filter with purge (V4)
Output Air module, complete with sensor and valve, for ZAS 1.5L
Output Air module, complete with sensor and valve, for ZAS 3L
Output Air module, complete with sensor and valve, for ZAS 6L
Output Air module, complete with sensor and valve, for ZAS 10L
Output Air module, complete with sensor and valve, for ZAS 20L
Output Air module, complete with sensor and valve, for ZAS 30L
Pressure regulation module, complete
Electronic board GOUS3 ZAS-1.5, programmed
Electronic board GOUS3 ZAS-3, programmed
Electronic board GOUS3 ZAS-6, programmed
Electronic board GOUS3 ZAS-10, programmed
Electronic board GOUS3 ZAS-20, programmed
Electronic board GOUS3 ZAS-30, programmed
Electronic board MB3800 with touch screen, ZAS software installed
Power supply PS3550-30
Compressor module for ZAS1.5 and ZAS 3, complete, 210-240V/50-60Hz
Compressor module for ZAS1.5 and ZAS 3, complete, 100-120V/60Hz
Compressor module for ZAS6 and ZAS 10, complete, 210-240V/50-60Hz
Compressor module for ZAS6 and ZAS 10, complete, 100-120V/60Hz
Compressor module for ZAS20 and ZAS 30, complete, 210-240V/50-60Hz
Compressor module for ZAS20 and ZAS 30, complete, 100-120V/60Hz
Air purifier module for ZAS1.5, complete, 210-240V/50-60Hz
Air purifier module for ZAS1.5, complete, 100-120V/60Hz
Air purifier module for ZAS3, complete, 210-240V/50-60Hz
Air purifier module for ZAS3, complete, 100-120V/60Hz
Air purifier module for ZAS6, complete, 210-240V/50-60Hz
Air purifier module for ZAS6, complete, 100-120V/60Hz
Air purifier module for ZAS10, complete, 210-240V/50-60Hz
Air purifier module for ZAS10, complete, 100-120V/60Hz
Air purifier module for ZAS20, complete, 210-240V/50-60Hz
Air purifier module for ZAS20, complete, 100-120V/60Hz
Air purifier module for ZAS30, complete, 210-240V/50-60Hz
Air purifier module for ZAS30, complete, 100-120V/60Hz

Details of the repair procedures are described in the service manual.

IMPORTANT!
The manufacturer reserves the right to change or modify its products without prior notice.

5.4 Return the generator to the retailer or the factory

In the event your generator must be returned to the factory for a repair which cannot be carried out on the spot, please contact your agent by specifying in detail the problem as well as the instrument operating environment, the type and the serial number.

This done, your agent will provide all the necessary instructions to return the generator in the best conditions.

In case where the warranty period would have expired, or in case the default would be due to misuse of the generator, all transport and repair costs incurred would be the sole responsibility of the user, unless special arrangement between the manufacturer and the client had been undertaken.

- → Disconnect the Zero Air Station from its application
- → Place the generator in its original packaging box or in another box where the generator cannot move
- → Fixe the FRAGILE label
- → Fill in and send back to your provider or to the factory the form called « **Return Autorization Sheet** » as you will receive from your Linde contact or the manufacturer. This document is necessary in order to link to the instrument all the information given to the service department by phone, e-mail or other means.

Make sure that the generator will never be exposed during transport or storage, to a temperature below -5°C.

Chapter 6. Troubleshooting and Alarms.

6.1 Troubleshooting

The following table describes typical cases of malfunction where the user may be able to fix without the help of a trained technician. If the following corrections do not eliminate operational failure, or when the failure is more complex the modular concept of the HiQ® Zero Air Station allows for an exchange of the faulty module without having to send back the complete unit back to the factory. Please refer to the service manual.

Standard troubleshooting causes and corrections

Symptom	Cause(s)	Correction(s)
The generator does not start, or nothing appears on the screen.	1) Faulty or badly connected electric cable 2) Fuse melted 3) Power cable between PS3550 and MB3800 or between MB3800 and screen not connected or faulty 4) MB3800	1) Check 2) Replace with a 2AT 3) Check 4) Card faulty
It is not possible to adjust the pressure to the setting value.	1) The alimentation pressure is lower than the setting value; 2) The Zero Air consumption is greater than the capacity of the generator; 3) The pressure sensor is out of order.	1) Verify the alimenting line 2) Verify there is some flow restrictor (the consumer) fixed at the Air Outlet. 3) Verify with a gauge
The generator does not reach the setting value of the pressure. AIR pressure Alarm	1) The alimenting pressure is lower than the Air setting pressure; 2) Zero Air consumption is greater than the capacity of the generator; 3) The generator supplies a circuit with a large dead volume, the pressure increase but too slowly. 4) There is a significant leak on the circuit between the generator and analyser.	3) If there is no leak on the circuit the desired pressure will be reached. To speed up the rise, reduce the circuit volume or acquire another generator and mount them in parallel mode. 4) Repair and eliminate the leaks.

Symptom	Cause(s)	Correction(s)
The generator does not generate a constant pressure	1) The consumption is not constant and grows quickly, the instrument cannot keep up; 2) The consumption is very close to the maximum, even go over it.	1) Install a small extra reservoir as well as a pressure regulator. 2) When this happens, reduce the consumption or increase the generation capacity.
Oven temperature close to ambient temperature	1) The heating cartridge is not functioning properly. 2) The control board GOUS3 is not connected to the internal communication bus.	1) Check the connector and wiring 2) Check connection and plug again the module
Oven temperature over 750°C	1) The heating cartridge is probably melted. The temperature sensor (thermocouple K-type) inside is out of order.	1) Check voltage by “Diagnostics” Menu and eventually wiring. Call the Service team for help on diagnostics. If heating cartridge is melted, the complete oven must be replaced.

Notes.

Getting ahead through innovation.

With its innovative concepts, Linde is playing a pioneering role in the global market. As a technology leader, it is our task to constantly raise the bar. Traditionally driven by entrepreneurship, we are working steadily on new high-quality products and innovative processes.

Linde offers more. We create added value, clearly discernible competitive advantages and greater profitability. Each concept is tailored specifically to meet our customers' requirements – offering standardised as well as customised solutions. This applies to all industries and all companies regardless of their size.

If you want to keep pace with tomorrow's competition, you need a partner by your side for whom top quality, process optimisation and enhanced productivity are part of daily business. However, we define partnership not merely as being there for you but being with you. After all, joint activities form the core of commercial success.

Linde – ideas become solutions.

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